IOWA STATE UNIVERSITY
Extension and Outreach

Integrated Crop Management

A historical perspective on dicamba

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At the recent North Central Weed Science Society annual meeting I was asked to provide the opening presentation (A historical perspective on dicamba) in a symposium focusing on issues with dicamba. Following are the slides and the abstract of my presentation.

Powerpoint presentation pdf

The auxin-like activity of the phenoxyacetic and benzoic acids was discovered in the early-1940's. The herbicide dicamba was first described in 1958, Velsicol acquired the patent for the molecule, and dicamba was first approved for use in the US in 1962. In subsequent years, the label was expanded for use on a wide range of grass crops and for non-crop areas. Dicamba has been described as either a benzoic acid or carboxylic acid compound, and mimics the activity of indole-3-acetic acid (Group 4 herbicide). According to USDA/ERS data, dicamba was used on less than 10% of US corn acres in 1979. Use increased to 15% of corn hectares by 1990, then as herbicide-resistant weeds spread, dicamba use on corn increased to 28% of hectares in 1995. Prior to the introduction of herbicide-resistant crops and Group 27 herbicides (HPPD inhibitors), dicamba primarily competed with atrazine and 2,4-D for broadleaf weed control in corn. Atrazine was preferred over dicamba and 2,4-D by most farmers due to its preemergence use, greater margin of crop safety, and lower risk of off-target injury. Dicamba use was much higher in northern states with high pH soils due to the carryover risk associated with atrazine. Dicamba was used on more than 70% of the 1985 corn hectares in North-Central and Northwest Iowa, compared to 12% of US corn hectares. High pH soils in this region prevented use of atrazine rates greater than 1 lb/A when rotating to soybean or other sensitive crops. The high sensitivity of soybean to dicamba has been an issue since its introduction. In a 1971 University of Illinois Extension bulletin, Dr. Ellery Knake discouraged the use of dicamba due to the risk it posed to adjacent soybean. Behrens and Leuschen published a seminal paper in 1979 reporting on factors that influence volatility

of dicamba, including temperature, rainfall following application, application surface (soil vs foliar interception), and formulation. A wide range in volatility was found among the salts of dicamba evaluated. The first dicamba product (Banvel) contained the dimethylamine salt of the parent acid. Over the years, several different salts of dicamba have been introduced, often with the intent of reducing dicamba volatility. Low volatility formulations include Banvel II (sodium) in 1981, Clarity (diglycolamine) in 1990, and most recently Xtendimax/Fexapan with Vaporgrip Technology (diglycolamine) and Engenia (BAPMA). Current research will determine the reductions in volatility achieved with these formulations. Increasing problems with herbicide-resistant weeds have led to an increase in dicamba use, and the introduction of dicamba-tolerant crops will continue this trend. The International Survey of Herbicide Resistant Weeds lists 36 weed species with evolved resistance to Group 4 herbicides, seven of these species are reported to be resistant to dicamba.

Category:

Weeds

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dicamba

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Dr. Bob Hartzler is a professor of agronomy and an extension weed specialist. He conducts research on weed biology and how it impacts the efficacy of weed management programs in corn and soybean. Dr. Hartzler also teaches undergraduate classes in weed science and weed identificatio...